inches), which is 3.3 millibars (.10 inch) below the normal.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Pacific Ocean and its shores October 1941*

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Millibars	*Millibars*	*Millibars*		*Millibars*	
Barrow	1,010.3	−3.2	1,032	27	998	5
Dutch Harbor	1,005.0	+.9	1,028	21	976	16
St. Paul	1,004.3	−.9	1,028	21	990	31
Juneau	1,007.1	−4.4	1,025	27	982	17
Tatoosh Island	1,016.9	+.6	1,028	2	1,002	11
San Francisco	1,015.2	−1.1	1,025	30	1,004	4
Mazatlan	1,011.2	+.7	1,014	23	1,000	1
Honolulu	1,014.2	−1.7	1,020	30	1,009	24
Midway Island	1,018.7	+1.8	1,025	23	1,008	6
Guam	1,007.2	−3.3	1,012	31	1,002	23
Hong Kong						

NOTE.—All data based on available observations, departures compiled from best available normals related to times of observation, except Juneau, Tatoosh Island, San Francisco, and Honolulu.

Cyclones and gales of the extratropics.—Following an unusually quiet September, the weather on the North Pacific became much stormier in October. At the beginning of the month gales of force 8 occurred in several parts of the ocean in minor disturbances. Off the central California coast northwesterly winds of force 8 were observed on the 1st and 2d. In the Okhotsk Sea a westerly gale of force 8 was reported on the 3d in connection with a cyclone of that region. Along the northern routes scattered gales of like intensity were experienced from the 1st to 4th. On the 8th and 9th fresh gales occurred in a disturbed area off the coast of Washington.

The period from the 12th to the 19th was one of considerable activity over the northeastern part of the ocean, while a cyclone of great intensity was central over and near the Gulf of Alaska. As early as the 12th one vessel encountered a wind of force 11 near 58° N., 149° W., with barometer down to 997 millibars (28.85 inches). On the 14th two ships, one near 51° N., 139° W., and the other near 50° N., 157° W., had southwesterly gales of force 9, with low barometers, as the storm spread southward. On the 15th and 16th scattered gales of force 8 to 12 occurred over a wide area from the coast of southeastern Alaska to a great distance seaward. One vessel, near 48° N., 151° W., at time of lowest barometer on the 16th, reported encountering southwesterly force-10 gales throughout about a 24 hour period. Another ship reported hurricane velocities at both a. m. and p. m. observations, near 48° N., 157° W. On the 16th to 18th, barometers were very low in the central Gulf of Alaska. A ship near 53° N., 148° W., on the 16th, had a low reading of 948.2 millibars (28 inches), with a southwesterly gale of force 10 that continued well into the 17th. Another ship on the 18th, near 56 °N., 145° W., had almost as low a barometer, with a northeasterly gale of force 10. On the 19th, south of Kodiak, a force-9 gale was reported.

The farthest southward spread of the storm, so far as covered by gale reports, was near 44° N., 134° W., where a force 8 wind was experienced, with only small depression of the barometer on the 18th. The farthest westward extent of the cyclone, at its time of most extensive development, was near the 180th meridian, where a ship in 42° north latitude had westerly gales of force 9 to 11 on the 15th and 16th.

From about the 23d to 25th an elongated low-pressure area extended north and south between approximately 25° and 50° N., 135° and 150° W. Scattered gale winds occurred within its boundary, but the most important was one of force 10 from the north, encountered near 27° N., 149° W., on the 23d.

Typhoons.—Subjoined is a report, by the Reverend Bernard F. Doucette, S. J., Weather Bureau, Manila, P. I., of a depression of October 18–23, and of a typhoon of October 22–November 2, which occurred in the Far East.

In addition to the foregoing, ships' reports indicate the existence of another typhoon which occurred well to the eastward of the Ogasawara (Bonin) Islands from at least the 11th to the 14th. Our earliest reports concerning its intensity came from a ship near 24° N., 155°–156° E., on the 11th and 12th. The highest wind force was 10, from northeast, lowest barometer 993.3 millibars (29.33 inches). To the northwestward ships reported fresh northeasterly gales on the 12th, and on the 14th a vessel rode through a south gale of force 10 near 33° N., 158° E. The cyclone is thus seen to have been moving northward well out at sea.

Tehuantepecers.—The only norther gale reported in the Gulf of Tehuantepec was one of force 8, on the 13th.

Fog.—Very few instances of fog are found in ships' observations over the open Pacific. It was reported on 2 days off the Washington coast, on 1 day off Oregon, on 5 days off California, and on 3 days off the upper coast of Lower California.

TYPHOONS AND DEPRESSIONS OVER THE FAR EAST

BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Depression, October 18–23, 1941.—About half way between Yap and Mindanao, a low pressure area became a depression, moving in a west-northwesterly direction on October 18 and 19. The afternoon and evening observations from stations near San Bernardino Strait indicated that the storm was intensifying, yet the morning of October 20 showed only a depression, central over Bondoc Peninsula, which had moved westerly across southern Luzon during the night. This weak center moved westerly into the China Sea. As a depression of minor importance, it moved northwest about 200 miles after leaving Verde Island Passage, then westerly to Indochina, where it disappeared.

Two lives were lost on Marinduque Island as this depression crossed the Archipelago. Considerable rain was reported from stations of southern Luzon and the Visayan Islands.

As this center was approaching southern Luzon, October 19, Virac, Catanduanes Island, reported 751.2 mm. (1,000.5 mb.), indicating that the storm was intensifying to typhoon strength. However, during the night, nothing lower than the above value was reported as the storm center moved across the Archipelago.

The upper winds over Zamboanga and Cebu changed from east quadrant to southwest quadrant on October 16. Almost at the same time, a mild surge from the east quadrant appeared over Guam. As the depression center came into existence, Zamboanga and Cebu velocities were weak, but directions showed a tendency to shift to the northwest quadrant. This tendency also appeared in the directions of the lower clouds over stations of the Visayan Islands. Because of these weak velocities and the movement of cool air from northern regions around the regions south of the center into the weak southwesterly air stream, there was no development. Velocities of the upper winds over Cebu and Zamboanga reached values of 50 and 60 k. p. h. only on October 20, when the depression center was moving toward Verde Island Passage. Other

days, values were below 40 k. p. h. Indications that the southwesterly air stream was weak over southern Indochina and Thailand were shown by the scattered reports received from these regions.

Typhoon, October 22–November 2, 1941.—As well as can be determined from available data, this typhoon seems to have formed far to the southeast or south-southeast of Guam. On October 22, a definite center, quite intense, seemed to be located about 300 miles south-southeast of Guam, and its movement was in a north-northwesterly direction. From October 23 to 25, this typhoon moved northerly along a course about 120 miles east of Guam. The next 3 days the center seemed to be close to and east of the northern Mariana Islands, stationary perhaps, or moving slowly in various directions. October 28 to 31 it moved west-northwest to the ocean regions about 300 miles southwest of the Bonin Islands. It either disappeared over those regions or moved about 500 miles to the east as a low pressure area (October 31 to November 2), after which no trace of the storm could be found.

The upper winds over Guam from October 17 onward were from the northeast and east quadrants, the velocities never exceeding 47 k. p. h., and mostly between 5 and 30 k. p. h. On October 21, the winds were backing to the north-northeast, velocities being less than 40 k. p. h. On October 22 and the two following days, the directions were from the north-northwest and north, with velocities ranging from 15 to 67 k. p. h. October 25 and the following days, Guam was under the influence of air streams from the west and southwest quadrants, with velocities less than 40 k. p. h. Stations over the Philippines were reporting directions from the northeast, east, and southeast quadrants during these days, with no evidence that the southwest monsoon air stream was present over the Archipelago.

After October 19, no ships' observations were on hand. The above account of the origin and course of the typhoon, especially after October 24, may have to be altered when observations from ships become available later.

RIVER STAGES AND FLOODS

By BENNETT SWENSON

The month of October was marked by continued drought conditions in the East and by floods in a belt extending from New Mexico and Texas northeastward to Illinois and Wisconsin. The floods were especially severe in the three states, Kansas, Oklahoma, and Missouri, and some adjacent areas, with unusually high stages in the Kansas, Neosho, Verdigris, Cimarron, Washita, North Canadian, Canadian, and Arkansas Rivers and their tributaries in Kansas, Oklahoma, and Arkansas and in the Osage River in Missouri. The floods were the highest observed in parts of the Smoky Hill, Osage, Verdigris, Neosho, and North Canadian Rivers, and the Arkansas River was rising to unprecedented heights in the vicinity of Fort Smith at the close of the month. The resulting property damage was extensive.

Atlantic Slope and East Gulf of Mexico drainage.—River stages remained unusually low with only a slight improvement in a few areas. Precipitation since the first of the year in all of the states in the drainage was well below normal. In the Middle Atlantic States the precipitation for the two months, September and October, has been especially scanty; New Jersey, Maryland, and Virginia had the least rainfall of record for these 2 months.

Upper Mississippi Basin and St. Lawrence drainage.—Precipitation was well above normal in most of this area and river stages were high. Flood stages were reached or exceeded, however, only in the Wisconsin, Rock, Des Moines and Illinois Rivers, and in the Mississippi proper from Quincy, Ill., to Grafton, Ill., during the month, with no appreciable damage.

The Wisconsin River rose to slightly above flood stage on October 8 and again on the 28th at Knowlton, Wis.

Heavy rains in the lower Des Moines River Basin, on the 8th, together with rises in the river from heavy rains upstream several days previously, resulted in some overflow in the lower reaches. The river reached 15.8 feet (0.8 foot above flood stage) at Eddyville, Iowa, on the 9th.

The Rock River showed two rises during the month, exceeding flood stage by 0.3 and 0.6 foot, respectively, on the 11th and the 25th at Moline, Ill. The Illinois River similarly experienced two rises during approximately the same periods to moderately high flood stages.

Heavy discharge from the tributaries of the Mississippi River resulted in slight overflows in the main channel from Quincy to Grafton, Ill. These high stages, together with the flood waters from the Missouri River, were expected to cause some flooding in the Mississippi below the Missouri junction, but failed to materialize due to the low stage in the Ohio River which permitted a rapid run-off in the Mississippi.

Ohio River Basin.—Stages remained unusually low generally throughout the Basin. The mean stage at Cairo, Ill., 22.5 feet, was high as compared to the October normal of 11.1 feet, but represented the stage of the Mississippi rather than the Ohio River.

Missouri and Arkansas River Basins.—Much of the month was characterized by the presence of a large anticyclone over the southeastern United States, producing a strong inflow of moist tropical air over the southern and central plains states. Frequent outbreaks of cold air resulted in heavy downpours over Iowa, Kansas, Oklahoma, Missouri, and parts of Arkansas and Texas. It was the wettest October of record in Kansas, Oklahoma and Missouri, with previous high records exceeded by large amounts in some cases; Missouri had 43 percent more rainfall than for any previous October and Kansas 50 percent more than heretofore recorded.

Floods have been the rule, rather than the exception, in the Kansas and Neosho River Basins this year from April to October, as is shown in table 1. Flood stage has been reached or exceeded in these basins every month during this period except in May. The months of particularly severe flooding were June, September, and October. The highest stages of record have been established at a number of points during the 7-month period.

The official in charge, Topeka, Kans., reports as follows on the floods in the Topeka district (including the Kansas River Basin except the Republican River, and the Osage and Neosho Rivers in Kansas):

> Overflows occurred in every river of the district during October 1941 and were especially severe along the Smoky Hill River, the upper reaches of the Neosho River, and the headwaters of the Cottonwood River. The Kansas River, which had never before been known to overflow later in the year than July, staged two distinct overflows from Manhattan to below Lawrence, Kans., during the month.
>
> Three cities in the district—Salina, Council Grove, and Marion, Kans.—suffered very serious overflows, which in each case covered much of their areas. At Salina, where the Smoky Hill reached the highest stage since 1903, 700 homes were damaged and the flood loss was placed at $100,000. At Council Grove, where there was a flash flood due to torrential rains in the headwaters of the Neosho